Drawing Out Inner Feelings:
The Visual Expression and Recognition of Emotions in the Art of Children with Autism

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This is to certify that the thesis prepared

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ABSTRACT

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This pilot research was undertaken in order to explore the visual expression and recognition of emotions in the art of high-functioning early school-aged children with autism. Children with autism have social and communication impairments which limit their ability to express and recognize emotions. The current study explored the expression and recognition of emotions in the drawings of children with and without autism in two stages. Firstly, a small sample of eight children with and without autism created drawings of four emotions: happiness, sadness, anger, and fear. Secondly, a larger group of thirty-two children with and without autism looked at these emotional drawings and chose which of the four emotions they recognized in each of the thirty-two drawings. Interestingly, drawings made by children with autism received significantly higher ratings of agreement than drawings made by typically developing children. Additionally, there was no significant difference between the performance of children with and without autism in their ability to recognize the intended emotion in the drawings. This offers some preliminary evidence that some children with autism may be able to recognize the intended emotion in drawings just as well as their typically developing peers. Findings from this preliminary study suggest that artistic expression and recognition of emotion may be potential strengths in some children with autism. This paper suggests avenues for further research and discusses some important applications to art therapy.

Keywords: art, drawing, emotion, expression, recognition, children, autism

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General Introduction

This pilot research was undertaken in order to explore the visual expression and recognition of emotions in the art of high-functioning early school-aged children with autism. Autism is characterized by social and communication impairments and restrictive or repetitive behaviours and interests (American Psychiatric Association, 2000). Autism is part of a spectrum of neurodevelopmental disorders which also includes Asperger's syndrome and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). Generally, Asperger's is characterized by a lack of cognitive and language impairments, whereas PDD-NOS is applied when full criteria for autism and Asperger's are not met but a child displays features of autism, such as minor social or emotional impairments (Johnson & Myers, 2007). Children with autism spectrum disorders exhibit a diverse range of abilities, including lower-functioning children who may have difficulty performing basic life skills, as well as higher-functioning children who may have average or even superior cognitive skills. The current research focused on higher-functioning children with diagnoses on the autism spectrum who did not have major cognitive or language impairments and so could successfully meet the demands of this study. For the purposes of this paper, the terms "autism" and "autism spectrum" will be used to refer to individuals with an autism spectrum disorder.

The current pilot study attempted to explore the expressive and receptive emotional abilities of high-functioning children on the autism spectrum using drawing as the mode of expression. I have a deep personal interest in this subject matter because I

have witnessed the expressive value of visual arts for children with autism. This pilot research emerged from my work at the Autism Research Centre at the Izaak Walton Killam (IWK) Health Centre and through my involvement in the Autism Arts program through the Provincial Autism Centre and the Art Gallery of Nova Scotia. Through my research, clinical, and community work, I had the opportunity to meet numerous children on the autism spectrum and came to see that although some individuals had unconventional ways of expressing themselves, this was not evidence of a lack of inner emotion. In fact, in my experience, children with autism often demonstrated that they were affected by the same range of emotions as other children, but that emotional regulation could be a challenge for some individuals. Based on clinical observation and emerging evidence (e.g. Chilvers, 2008; Lim & Slaughter, 2008), I thought that the visual expression and recognition of emotion might be strengths for children on the autism spectrum, who are often seen as a population with socio-emotional impairments.

Traditionally, research has pointed to a variety of limitations in the emotional abilities of children on the autism spectrum. Children with autism seem to require significant cognitive effort to recognize and express emotions (Attwood, 2007). They often have difficulty using nonverbal behaviours in social situations and seem to lack emotional reciprocity, although many children express a desire to have friends (Lacava, Golan, Baron-Cohen, & Smith Myles, 2007). Such impairments in emotional functioning may create major barriers for children with autism and can make it difficult for them to engage in meaningful social relationships (Dapretto et al., 2006). Delays in the development of emotional skills often prevent children with autism from understanding others and from having their voices heard (Chilvers, 2008). Based on a growing body of

art therapy literature, I thought that visual arts might provide a nonverbal method of communication that could help give children with autism a voice (e.g. Bentivegna, Schwartz, & Deschner, 1983; Buck, Goldstein, & Kardeman, 1984; Emery, 2004; Fox, 1998; Rozelle, 1982; Stack, 1998). This pilot research suggested avenues for future research and implications for art therapy, which will be addressed in the discussion.

The current research was undertaken in order to investigate both the visual expression and recognition of emotion in children on the autism spectrum. As a graduate student in the Creative Arts Therapies Department at Concordia University, I am interested in emotional understanding in children with autism and believe that the visual arts are a powerful way to express inner feelings. I have a strong interest in both psychology and visual arts, and believe that the arts and sciences inform one another. In this pilot research, I attempted to draw on both the quantitative research methods I acquired through my Honours in Psychology and the qualitative research methods I learned through my Masters in Art Therapy. I thought that mixed research methods, including both quantitative and qualitative approaches, would enrich this investigation and provide a fuller view of the picture. This current graduate research project was conducted over the summer of 2010 at the Autism Research Centre under the co-supervision of Dr. Susan Bryson at Dalhousie University and Irene Gericke at Concordia University.

Expression of Emotion

My understanding of the expression of emotions involves the process of externalizing inner feelings, through avenues as diverse as facial expressions, body postures, words, or artistic expressions. Creating art can help individuals express, release,

change, and match emotions (Callaghan, 2000). Although art seems to be an effective way for children to express their inner world, there is little research demonstrating how children express their feelings through artwork (Kim, 2010). Burkitt (2004) outlined how children's drawings can range from scribbles to realistic depictions of reality and their artistic expressions can serve a variety of purposes from decoration to expression of inner thoughts and feelings. Drawing is a basic form of interpersonal communication and a constructive way to express the inner self (Kellman, 2001).

To date, there is a lack of research on the ability of children with autism to express emotions through artwork. However, there are some famous case examples of artistic giftedness in individuals with autism (e.g. Arnheim, 1980; Buck, Kardeman, & Goldstein, 1985; Henley, 1989; Wassing & Van Krevelen, 1968) and numerous individuals on the autism spectrum with notable artistic ability, such as Esther Brokaw, Seth Chwast, Wil Kerner, Amanda LaMunyon, Jonathan Lerman, Henriett Seth-F, Gilles Tréhin, Richard Wawro, George Widener, Stephen Wiltshire, and Ping Lian Yeak. Although savant abilities are well-documented, the nature of these artistic talents is poorly understood (Hermelin, 2001). Chilvers' (2008) collection of art by children with autism also shows the richness of their artwork and suggests that some children are able to use visual arts to express their inner feelings. Allen (2009) outlined how some children with autism readily create artwork, although little is known about the meaning that they attribute to these images. Although children on the autism spectrum may have difficulty expressing emotion, this is not necessarily indicative of a lack of inner emotion. Indeed, based on my clinical experience, I thought it was possible that children with autism may be better at expressing emotion artistically than verbally.

Allen (2009) provided a concise summary of previous research to highlight how the general drawing skills of children with autism seem to be comparable to typically developing children of the same age, although there are some individual differences in drawing style. Allen outlined research showing how children with autism have difficulty producing distinctive drawings of people but not of objects and also seem to have difficulty using their imagination to draw impossible or fantastical figures. Although the visual expression of emotion in the artwork of children with autism has not been the subject of much study, human figure drawings have been of interest in autism research. Lim and Slaughter (2008) asked children with autism to produce drawings of a person, a house, and a tree and found that there were no significant differences in formal ratings between the children with Asperger's and typically developing children on the tree or house drawing scores; however, the human figure drawing scores of children with Asperger's were significantly lower than those of the typically developing children. Lim and Slaughter suggested that the difficulty children with autism seem to have drawing human figures may stem from a lack of practice drawing people or a lack of interest in the social world. However, based on the numerous children with autism I have met who have expressed a genuine interest in making friends despite peer rejection, I am not convinced that it is a lack of interest but perhaps a lack of skills in emotion recognition and expression that sometimes cause children with autism to withdraw into their own worlds. Additionally, Lee and Hobson (2006) elicited human figure and house drawings of self and others, and found that most children with autism did not create clear distinctions between their drawings of people but clearly differentiated their drawings of different houses. However, Lee and Hobson caution that given the lack of knowledge

about the development of drawing in children with autism it is difficult to make any firm conclusions from these findings. Overall the research outlined above seems to indicate that although the general artistic abilities of children with autism seem to be unimpaired, they tend to have difficulties drawing distinctive human figures.

Although little is known about the affective artwork of children with autism, it is widely acknowledged that the art of typically developing children communicates feeling through an expressive use of line and colour (Misalidi & Bonoti, 2008). A number of studies have found that children's drawings of different feelings are generally regarded as emotionally expressive, the quality of expression generally increases with age, and happiness is often the emotion most easily recognized in children's drawings by both children and adults (e.g. Bonoti & Misaldi, 2006; Brechet, Baldy, & Picard, 2009; Jolley, Fenn, & Jones, 2004; Winston et al., 1995). Koike (1997) identified numerous strategies used by typically developing children in their emotionally expressive drawings, including reliance on facial expressions, gestures, image scheme, emotion-evoking situations, and symbols, and noted that children tended to use more strategies with age. Sayd (2001) found that children primarily rely on mouths to depict facial emotion and exclude other facial features such as the eyebrows. Paál (1977) analyzed 9,000 children's drawings and found that the development of aesthetic qualities seems to be a highly individual process and that in general children's drawings were emotionally expressive.

During my review of the literature, I was not able to find any standardized scales which measure emotion in children's drawings. There have been three major approaches to analysing children's drawings, including developmental approaches scoring accuracy and representation to establish intellectual maturity, psychological approaches examining

meanings depicted in the artwork, and meaning-making approaches exploring how children make sense of the world through visual representations (Holliday, Harrison, & McLeod, 2009). Within these approaches there are several art therapy assessment tools, including the House-Tree-Person Assessment, Face Stimulus Assessment, Levick Emotional and Cognitive Art Therapy Assessment, Person Picking an Apple from a Tree Assessment, and Silver Drawing Test of Cognition and Emotion, among others **(**Betts, 2005). However, many of these assessments seem highly subjective and there is no standardized scale to assess the expression of emotion specific to the drawings of children with autism.

There are a multitude of issues to consider when assessing children's drawings. Artistic expression is a highly individual process which is difficult to measure, let alone standardize (Frisch, Franko, & Herzog, 2006). External assessments may be invalid or unreliable if they misinterpret the meanings of children's drawings, placing emphasis on features such as line and colour that may have been unintentionally included or omitted (Holliday, Harrison, & McLeod, 2009). Moreover, it may not be valid to make meaning from a single drawing as it may not be representative of a child's abilities and other drawings created by the same child may convey different meanings which can change over time (Holliday, Harrison, & McLeod, 2009).

Art therapists traditionally assess children's drawings using direct methods of analysis which focus on external interpretation, neglecting the child artist's understanding (Driessnack, 2006). Recently, there has been a shift toward a process therapy approach in which children's own interpretations of their artwork are emphasized (Driessnack, 2006). Reflecting this shift, the current study sought to engage children in a narrative dialogue

about their artwork through the use of draw-and-tell conversations. Draw-and-tell conversations are a child-directed form of process therapy which gives a qualitative approach to data collection and analysis (Driessnack, 2006). As opposed to more traditional interview techniques, the draw-and-tell story allows children to express themselves both verbally and artistically. It has been found that drawing is a method that can help to facilitate communication by increasing both the quantity (Driessnack, 2005) and quality of information that children share about emotionally charged life events (Driessnack, 2006).

Recognition of Emotion

My understanding of the recognition of emotions involves the process of identifying feelings in oneself or in another person or expression, such as an expressive piece of artwork. Through expressive artwork we may be able to understand or identify with another person's internal feeling states, as viewing art has the power to evoke and alter human feelings (Silvia, 2005). However, research exploring typically developing children's recognition of emotion in artwork has yielded inconsistent findings. Winner and colleagues (1986) found that the ability to identify emotions in drawings develops around the age of 9 to 12 years, whereas Callaghan (1997; 2000) found that from as early as 5 or even 3 years of age children can understand the emotions expressed in drawings. The variability in these findings may be due to differences in the requirements of the tasks (Misalidi & Bonoti, 2008); therefore, additional research in this area is required. A variety of research has examined typically developing children's ability to recognize emotion in drawings and paintings from art history (for a review see Stanley, 2001). Generally, research has shown that children's recognition abilities improve with age and

older children tend to rely on formal qualities of the artwork, whereas younger children rely more on the structural properties. All children seem to rely on the mouth and the eyes as indicators of the emotional state of the person depicted in the artwork. Similarly, Prusakova and Sergienko (2006) found that younger children tend to rely on situational characteristics and older children rely on facial expressions to recognize emotions in artwork. Callaghan and Rochat (2003) found that children aged 5 and 7 years were able to accurately judge the impact of artists' emotions on their happy or sad paintings, whereas 3-year-olds had difficulties making these attributions. Interestingly, Callaghan and Rochat also found that performance on this emotion recognition task was correlated with performance on theory of mind tasks, which measure a child's understanding of other people's mental states. This finding suggests that social understanding may underlie the ability to associate an artist's emotional state with the expressed emotion in their artwork. This is of particular importance for children on the autism spectrum, who traditionally have difficulty with theory of mind tasks (e.g. Baron-Cohen, Leslie & Frith, 1985; Eisenmajer & Prior, 1991; Perner, Frith, Leslie & Leekam, 1989).

There is a variety of research documenting the difficulties that children on the autism spectrum have when attempting to recognize emotions. As outlined by Wolf (2006), research indicates that children with autism have difficulty processing faces, which is generally attributed to amygdala dysfunction as well as the use of feature-based rather than holistic face processing strategies. In this way, children see one feature, often the mouth, and do not take in all the other features to see the face as a whole. I was interested to learn what strategies children with autism used when making decisions

about emotions in drawings so I included a qualitative question about this in the current pilot study.

In previous research, Tell (2010) found that children with autism had difficulty recognizing the expression of basic emotions, particularly sadness and fear. Kuusikko and colleagues (2009) examined upper facial basic emotion recognition and found that children with autism more frequently associated ambiguous stimuli with "darker" emotions such as sadness, anger, or fear. This research by Kuusikko and colleagues suggests that children with autism have difficulties with emotion recognition but that this seems to improve with age. Interestingly, Begeer and colleagues (2006) reviewed how past research suggests that children with autism have difficulty attending to facial expressions of emotion. However, their research suggests that this deficit disappears when children are explicitly asked to make socially relevant decisions. This suggests that attention to emotional facial expressions in children with autism is influenced by situational factors. Losh and Capps (2006) found that children with autism may have less coherent representations of emotional experiences and use alternative strategies for interpreting emotional events. Notably, Rump and colleagues (2009) outlined how over thirty-five studies have examined the ability of individuals with autism to recognize emotions in facial expression; however, so far no research has clearly outlined the development of emotion recognition skills in individuals on the autism spectrum or provided concrete evidence that children with autism truly have a deficit in recognizing emotions conveyed through facial expressions.

Other research shows that children with autism have difficulty regulating their mood states. This is clinically important because, as outlined by Mauss and colleagues

(2011), “lighter” emotions such as happiness seem to be directly related to better psychological functioning. Konstantareas and Stewart (2006) found that children with autism showed greater variability in affect regulation, had lower attention focusing, inhibitory control, and soothability, and used less effective emotion regulation strategies than typically developing children. According to Ashburner, Ziviani, and Rodger (2009), children on the autism spectrum are rated by their teachers as exhibiting significantly more behavioural and emotional difficulties, including attention difficulties, anxiety, depression, and oppositional and aggressive behaviours. This research suggests that some children with autism are struggling to regulate their emotions and behaviours, despite a variety of specialized support. These findings highlight the importance of research into ways to help children on the autism spectrum understand and regulate their emotions. Begeer and colleagues (2007) found that children with autism differed in their understanding of the influence of mood states on behaviour. They found that children with autism used more explicit and less implicit descriptions, and less often used mood-related explanations to predict and explain behaviour. Begeer and colleagues postulated that children with autism may have a rote rather than self-generated understanding of emotion, which could be addressed through art therapy activities focused on increasing emotional understanding through creative expression and embodiment of mood states.

Additionally, Shalom and colleagues (2006) had a small group of children with and without autism view images of pleasant, unpleasant, and neutral pictures and took measures of skin conductance and self-report ratings of pleasantness and interestingness. They found that there was no difference between children with and without autism on measures of skin conductance but self-report ratings were different, as children with

autism gave more similar responses regarding the pleasantness and interestingness of the pictures than typically developing children. This research suggests that children with autism have normal physiological emotions but differences in the expression of conscious feelings. These findings suggest that socio-emotional expression deficits in children with autism may be related to impairments in perception or expression of conscious feelings; however, physiological emotions may be intact. This supports my assumption that children with autism may experience emotion but simply express it differently than other children.

Finally, Williams and Happé (2010) summarized how research on emotional understanding in autism has produced inconclusive results. Williams and Happé investigated the abilities of children with autism to recognize so-called social and non-social emotions in others and also report their own experiences of these emotions. They found that all children, including participants matched for age and ability, had more difficulty recognizing and reporting social emotions than non-social emotions. Interestingly, contrary to predictions, no differences between children with autism and controls were found in levels or patterns of performance on these tasks. Williams and Happé go on to discuss how these findings suggest that either emotional understanding may not be as impaired in children with autism as was traditionally assumed, or that children with autism may be using compensatory strategies that help them succeed on emotional processing tasks. In light of these mixed results, the current pilot study attempted to explore the expressive and receptive emotional abilities of high-functioning children on the autism spectrum using drawing as the mode of expression.

Current Study

The purpose of the current pilot study was to explore the expression and recognition of four basic emotions in the drawings of high-functioning early school-aged children on the autism spectrum. Despite the inconsistent findings of previous research (e.g. Winner et al., 1986; Callaghan, 1997; 2000), the age of participants in the current study was delimited to include early school-aged children between 4 and 9 years of age. Early school-aged children were the focus of this study because at this important developmental stage many children begin primary education and establish basic social networks. The population of children with autism was also delimited to include only individuals with high-functioning autism or Asperger's syndrome so that they would have the cognitive and language skills necessary to understand the directives and participate confidently in the study.

Based on previous research (e.g. Misalidi & Bonoti, 2008), it was assumed that typically developing children would understand the four basic emotional categories and be able to categorize artwork along these lines. However, it was not known how children with autism would respond to these directives. It was also assumed that although there is some controversy in the research, children with autism do in fact experience emotions and are capable of the expression and recognition of different feelings; however, the quality of their emotional processing may differ from that of typically developing children. The current research may be seen as a first step in the exploration of artistic emotional expression and recognition in high-functioning children on the autism spectrum.

Given the limited ability of children with autism to express and recognize emotions in others and in themselves, it was expected that they would have more difficulty visually expressing and recognizing emotions in artwork than their typically developing peers. Typically developing children's ability to recognize emotion in drawings is thought to emerge between the ages of 3 and 12 years. Therefore, it was expected that children with autism would develop these skills at a later age than their typically developing peers. Although the ability to express and recognize emotions in the drawings of other children may differ for children with autism and typically developing children, some level of ability was expected in all children. Indeed, it was postulated that children with autism may even be better at expressing emotions artistically than verbally.

This pilot research can be conceptualized as four distinct studies, outlined by four separate questions:

1. Do children with autism have more or less difficulty accurately recognizing the intended emotion in the drawings of other children as compared to their typically developing peers?
2. Do children with autism have more or less difficulty than typically developing children accurately recognizing the expression of emotion in the artwork of other children with autism as compared to the artwork of typically developing children?
3. For children with autism and for typically developing children, is there a difference in their ability to recognize the emotions happiness, sadness, anger, and fear in drawings by children with autism as compared to drawings of typically developing children?
4. How do children recognize emotion in their peers' artwork?

There is value in both quantitative and qualitative data; therefore, this current research project was designed using mixed methods in order to give a fuller view of the data. The first two research questions outlined above were answered using quantitative methods, and the third research question was addressed through qualitative methods. Although the literature outlined above yields mixed findings, given my observations of the capacity of children with autism to create expressive artwork, I was not convinced that children with autism would be impaired in their artistic expression and recognition of emotions. However, I maintained an exploratory approach and stayed open to surprises. I wanted to see how children would respond to the directives and how varied their responses would be. I was not sure where to focus a lens so I drew from multiple perspectives to gather exploratory data. The quantitative and qualitative approaches informed one another by adding richer detail and showing different aspects of the emotional abilities of the children in this study.

Methods

Participants

A total of 40 early school-aged children between the ages of 4 and 9 years of age participated in this study. Participants were recruited through referrals from the Autism Research Centre, IWK Health Centre and local daycares. All of the children were Caucasian and English-speaking and tested in Nova Scotia. In addition to completing the requirements for this study, each participant's general language level was assessed using the *Oral and Written Language Scale* (Carrow-Woolfolk, 1996). Twenty of the participants had a formal diagnosis of an autism spectrum disorder and 20 children had no diagnosis of a developmental disability, and so for the purposes of this study are

referred to as “typically developing.” Children were included in the study if they had a verbal-mental age of approximately 5-7 years, a chronological age of approximately 4-9 years, proficiency in English, reported normal or corrected to normal vision, and reported normal hearing. No formal screening criteria beyond these were used so that as many children as possible could be included in this pilot study.

Participants were seen in two phases. The first phase of the study, which involved expressing emotions, included a total of 8 children, half of whom had autism. The 4 children with autism (1 girl and 3 boys) aged 6-03 to 7-10 (*M* = 7-05) had verbal-mental age estimates ranging from 4-11 to 5-09 (*M* = 5-03), suggesting that overall these 4 children with autism had slightly delayed language. The 4 typically developing children who participated in the first phase (2 girls and 2 boys) were aged 5-10 to 6-11 (*M* = 6-04) and had verbal-mental age estimates ranging from 4-11 to 7-07 (*M* = 6-02). Two children had slightly delayed language, one was average, and one was advanced.

The second phase of the study, which involved recognizing emotions, included a total of 32 children, half of whom had autism. The 16 children with autism (5 girls and 11 boys) aged 4-00 to 9-05 (*M* = 6-10) had verbal mental ages ranging from 2-11 to 9-08 (*M* = 5-09), since many children were delayed and others were advanced. The 16 typically developing children (8 girls and 8 boys) aged 4-10 to 7-09 (*M* = 5-11) had verbal mental ages ranging from 4-11 to 7-10, indicating that although there was some individual variation, overall children’s language scores were average.

Procedure

In both the first and second phase of this study, participants were seen on an individual basis in a quiet, private room in the children’s hospital, their daycare, or their

home. Each child was seen for a single visit, lasting less than one hour. Children's parents were invited to observe the session as a silent observer if the child assented. See the appendices for a copy of the recruitment letters and poster, information and authorization form, and certificate.

Phase I: Expression of Emotion. The first phase of the study was modelled after the work of Driessnack (2006). This phase included 4 participants with autism and 4 typically developing children. Each participant was introduced to the student researcher who conducted the study. Children were shown the art supplies and told that they would have the opportunity to make art about different feelings. Additionally, children were informed that their drawings would later be shown to other children so that they could look at pictures about feelings. Children were reminded that they could not bring this artwork home with them but that they could have copies of the pictures. Children were also informed that they would be given the opportunity to create another drawing at the end of the session which they could take home with them. At this point, although guardian consent had already been obtained, children were asked to give their verbal assent and they were reminded that their participation was voluntary.

When prompting the children to create each of the drawings, the facilitator used structured directives and said, "All of us have different feelings. Think about a time when you felt really happy. Please draw a picture of yourself at that time when you felt happy." This same directive was repeated for the emotions sadness, anger, and fear. Children were provided with markers and paper, and asked to draw four separate pictures representing these four different emotions. The directives were open-ended and framed so that drawings could be concretized in personal experience. This created a depiction of the

self within an emotional situation and showed not only how children represent themselves but also how they express different emotions in their drawings. Children were given approximately 10 minutes to create each drawing. The order of questions was counterbalanced using a Latin square design; however, each child ended the study by creating an additional drawing of their choice. This nondirected drawing gave children the opportunity to express themselves freely before leaving the session and also provided a drawing that they could take home.

Each of the 8 children created 4 drawings that were used as the data for this study. This produced a total of 32 images that were used in the recognition phase. The facilitator expressed appreciation and gratitude toward each child for sharing their experiences and helping with this important research. At the end of the study, each child was given a certificate thanking them for their contribution, a small book about a girl who likes to draw, and the choice of a small toy.

Phase II: Recognition of Emotion. The second phase of the study was modelled after the work of Misalidi and Bonoti (2008). This phase involved 16 participants with autism and 16 typically developing children. Each participant was introduced to the student researcher who conducted the study and then was invited to look at the drawings. The student researcher told each child "I would like to show you some drawings that other children made about different feelings." At this point, although guardian consent had already been obtained, children were asked to give their verbal assent and reminded that their participation was voluntary.

Children were told that each drawing was about one of four different feelings and they could choose from the labels "happy," "sad," "angry," or "scared" which were typed

in black ink on small white cue cards. Children were prompted by the student researcher to, “Tell me which feeling the drawing is about” as they were presented with the 32 images that were produced by other children in the first phase. Children were given the choice to respond verbally (by saying the emotion) or by pointing to one of the four cue cards. Once the participant had viewed all 32 drawings, they were then asked, “How did you know what feeling went with the drawing?” and, “Was there anything else about the drawings that helped you make your choices?” These responses were recorded verbatim and analyzed to examine what strategies children used to recognize the emotions in the drawings. At the end of the study, each child was given a certificate thanking them for their contribution and the choice of a small toy.

Results

The primary objective of this pilot study was to investigate the expression and recognition of emotions in the artwork of early school-aged children on the autism spectrum. This was accomplished in two phases in order to first observe the expression of four emotions in children’s drawings, and then to investigate the ability of children to recognize the emotions happiness, sadness, anger, and fear in the drawings of other children.

Expression of Emotion

The 8 children who participated in the expression phase of this pilot study created a diverse range of drawings of emotions (see Figure 1 for a visual summary). As one might imagine, there was a range of drawings created by this small sample of participants. Although all drawings seemed to be emotionally expressive, the intended emotion of some drawings was more easily guessed, as the children rating the drawing

agreed with the original drawer's interpretation. The drawings with the highest agreement for each of the four emotions are included in the figures section of this manuscript. In the recognition phase of this study, two "happy" drawings were accurately guessed by all 32 children. Figure 2 is a "happy" drawing created by a girl on the autism spectrum and Figure 3 is another "happy" drawing created by a typically developing girl, both of which were accurately guessed by all of the children. Figure 4 depicts a "sad" drawing by a boy with autism which 31 of the 32 children guessed correctly. Figure 5 depicts the drawing with the highest agreement for anger, which was created by a boy with autism. This drawing was accurately guessed by 16 of the 32 children. The two drawings with the highest agreement for fear were accurately guessed by 18 of the 32 children. Figures 6 and 7 depict these "scared" drawings, which were created by two different boys with autism. It is of interest to note that five of the six drawings with the highest agreement for each emotion were created by four different participants with autism; however, there was a large range of agreement for all 32 drawings, so this finding could simply be due to chance.

Only three drawings were not correctly guessed by any of the raters. These drawings were created by two different typically developing girls. Figure 8 depicts an "angry" drawing by a typically developing girl but all 32 children guessed it represented happiness. This was a pattern that emerged for all four of this child's drawings, which were similar in style and had a high proportion of guesses for happiness. Finally, Figure 9 depicts a "sad" drawing by another typically developing girl but none of the children guessed that this drawing represented sadness, and 28 of the 32 children guessed this drawing represented happiness. It is notable that this same child created the "happy"

drawing in Figure 3 and all 32 children guessed it represented happiness. It seemed that a few of the typically developing participants displayed more of a tendency to create drawings that were perceived by others as "happy."

Recognition of Emotion

Data analysis for the recognition phase of this pilot study consisted of a quantitative approach, modelled after the work of Misalidi and Bonoti (2008). Responses judged correct (match between the emotion the artist intended to express and the emotion selected by the participant) were given 1 point and all other answers were given a score of 0. Each child's correct responses across the 32 drawings were summed and entered into an SPSS database for analysis. Note that the descriptive statistics from the emotion recognition phase are available in Appendix 8.

A 2 x 2 x 4 factorial analysis of variance (ANOVA) was conducted in order to answer the first three quantitative questions. The first research question was: Do children with autism have more or less difficulty accurately recognizing the intended emotion in the drawings of other children as compared to their typically developing peers? The ANOVA revealed no significant effect of rater diagnosis, $F(2,31) = 3.677$, $p > .065$, indicating that there was no significant difference in the recognition abilities between the group of children with autism and the group of typically developing children. However, this finding points to a possible trend which suggests that there may be a small, non-significant difference between the groups, with a trend toward typically developing viewers having higher agreement with the artist's intended emotion than viewers with autism. The results from this question are illustrated in Figure 10.

The second research question was: Do children with autism have more or less difficulty than typically developing children accurately recognizing the expression of emotion in the artwork of other children with autism as compared to the artwork of typically developing children? In addition to an examination of the difference between the two groups of children from the recognition phase (raters with and without autism), I was also looking at the difference between their recognition of drawings made by the two groups of children from the expression phase (drawers with and without autism), so that I could see if children with and without autism were able to successfully recognize emotions in the drawings of other children with autism and also the drawings of typically developing children. The ANOVA revealed a significant effect of drawer diagnosis, $F(2,31) = 45.547$, $p < .001$, indicating that drawings made by children with autism received significantly higher ratings of agreement than drawings made by typically developing children. However, there was not a significant interaction between rater diagnosis and drawer diagnosis, $F(2,31) = 0.214$, $p > .647$, indicating that the impact of the diagnosis of the rater on the recognition of emotions was not significantly affected by the diagnosis of the drawer. These results are illustrated in Figure 11.

The third research question was: For children with autism and for typically developing children, is there a difference between the recognition of the emotions happiness, sadness, anger, and fear in drawings by children with autism as compared to typically developing children? The ANOVA revealed a significant effect of emotion, $F(2,31) = 379.039$, $p < .001$, indicating that happiness received significantly higher ratings of agreement than the three “darker” emotions. These results are illustrated in Figure 12. There was not a significant interaction between rater diagnosis and emotion,

$F(2,31) = .701$, $p > .409$, indicating that the impact of the diagnosis of the rater on the recognition of emotions was not significantly affected by the emotion portrayed in the drawing. There was not a significant interaction between drawer diagnosis and emotion, $F(2,31) = 2.678$, $p > .112$, indicating that the impact of the diagnosis of the drawer on the recognition of emotions was not significantly affected by the emotion portrayed in the drawing. Finally, the 2 x 2 x 4 ANOVA revealed no significant three-way interaction between rater diagnosis, drawer diagnosis, and emotion, $F(2,31) = 1.085$, $p > .306$.

The fourth research question was: How do children recognize emotion in their peers' artwork? Responses to the question, "How did you know what feeling went with the drawing?" from the recognition phase of the study were analyzed to see which strategies children used to recognize the emotions in the drawings. There appeared to be important differences in the reported strategies that children with autism and typically developing children used to recognize emotion in the drawings. Over half of the typically developing children (9/16) said they looked at the faces to make their decisions, whereas, only about one-third (5/16) of the children with autism relied on the face. Instead, over half of the children with autism (9/16) reported that they did not know what strategies they used or gave no clear response, in comparison to only 2/16 typically developing children who were not sure. Some children used the mouth as an indicator of the emotion in the drawing, including 3 typically developing children and 2 children with autism. Finally, 2 typically developing children said they relied on the entire person to make their decisions. Interestingly, children did not report reliance on any other parts of the picture besides the human figures. Formal qualities of the artwork, such as color or line quality, did not seem to be explicitly considered, which is consistent with previous research.

Discussion

Expression of Emotion

Since research of this kind has never been conducted with children on the autism spectrum, I was not sure how children would respond to the directives to create drawings of emotions. All 8 participants successfully completed the task and depicted images of themselves experiencing each of the four emotions. The most notable conclusion that can be drawn from the first phase of this pilot study is that both children with and without autism seemed to be capable of creating drawings depicting emotions.

Although a plethora of interesting analyses could be conducted on these drawings, I avoided "rating" the drawings from an "expert" perspective by having the child artists' peers decode the emotions in the artwork. Kelly (1984) highlighted how drawings can communicate inner feelings, even if these are not always fully understood by outside observers. Kelly indicated that communication in children's drawings is "egocentric," as the expression often seems to be primarily for the child. Kelly concluded that researchers must understand the unique graphic language of each child and avoid interpreting drawings based on general measures which may miss the richness of individualized expression.

It seemed to be of interest to observe both the differences between individual children and between the two groups based on diagnosis. Two of the typically developing children in the expression phase of this study seemed to have difficulty drawing anything but happy faces. One typically developing girl (Participant #8 in Figure 1) created four drawings that were all very similar, except her drawing of happiness had context. Additionally, one typically developing boy (Participant #5 in Figure 1) who was asked to

make a happy drawing first, automatically drew a happy face in each of his three consecutive drawings and had to cross it out numerous times before drawing non-happy faces for the other three emotions. Two of the other typically developing participants (Participants #6 and #7 in Figure 1) relied largely on context to express the intended emotions. The four participants with autism did not seem to have difficulty creating distinct drawings for each of the four emotions. For two of the children with autism (Participants #1 and #3 in Figure 1), context was of central importance, and the four images included elaborate stories which explained the figure's feeling states. Another boy with autism (Participant #2 in Figure 1) relied on iconic facial expressions to portray the different emotions, whereas another boy with autism (Participant #4 in Figure 1) relied mostly on the size of the figure to illustrate the emotions. Each of the children who participated in the expression phase of this study used unique strategies to create emotionally expressive artwork.

Most of the autism literature on emotion is about recognition as opposed to expression, as expression of emotions seems more difficult to measure. Nonetheless, this pilot study showed that some children on the autism spectrum were able to successfully express emotions through drawing. Conceivably, a rich qualitative study could focus solely on the 32 drawings that were created from this first phase of the study; however, for the purposes of this pilot study I also wanted to focus on the recognition of emotion by both children with and without autism.

Recognition of Emotion

Collectively, the results from these four separate questions from the second phase of the study indicate that children diagnosed with high-functioning autism are not as

impaired as may have been originally thought. The main finding that there was no significant difference in emotion recognition between children who do and do not have autism is of interest because it provides preliminary evidence that children on the higher end of the autism spectrum may not have significant impairments in their ability to identify basic emotions in other children's artwork. However, these results must be interpreted with caution given the limited sample of children that were included in this pilot study. Further research is required to investigate if there is in fact no significant difference between children with and without autism and what the implications of this possible finding of no difference might suggest.

Interestingly, both children with autism and typically developing children had higher agreement with the artist's intended emotion when viewing the drawings of children with autism, perhaps indicating that children with autism were better able to express the emotions in a more easily recognizable way. This may point to a strength in children with autism to visually depict emotions. However, conclusions are limited given the small sample of children who created the drawings. Overall, children with autism were significantly better at creating drawings that were more easily identified, especially for the emotions sadness, anger, and fear. Perhaps the drawings of children with autism were more easily recognized by other children because they are better at portraying these "darker" emotions due to heightened awareness of these feelings. It is possible that given their social difficulties, children with autism may be prone to experience sadness, anger, and fear more often than typically developing children. Additionally, it seems likely that children with autism are explicitly educated about a variety of feelings and so are more acutely aware of the differences between these emotions. It is also possible that children

with autism used exaggeration in order to depict the differences between feeling states because in their own experience feelings have to be obvious in order to be detected. Many children with autism also learn about feeling states through the use of pictorial icons, whereas typically developing children are not often taught to think about feelings in the same way.

Happiness was much easier to rate than the other "darker" emotions for both children with and without autism. Although all children were able to identify happy drawings with relative ease, distinguishing between sadness, anger, and fear seemed to be much more challenging. This finding is consistent with previous research, although the happy drawings may have been easier to guess in the current study because the expression of this so-called "lighter" emotion seemed to contrast with the other three "darker" emotions. Additionally, it seemed that children were more easily able to express happiness in the first phase of the study, which made it easier to recognize it in the recognition phase, possibly because it is a more socially acceptable feeling. Perhaps there was such a distinction between children's ability to recognize happiness compared to the other emotion because many children have a tendency to split feelings into two categories: "good feelings" and "bad feelings." This type of splitting may make it easier to recognize happiness, but more difficult to distinguish between sadness, anger, and fear. Perhaps children do not need to distinguish between the subtleties that characterize anger, sadness, or fear when recognizing emotion expressed by another person because they know that if their caregiver has any one of these emotions it is simply "not good". Misalidi (2008) summarized previous research which found that children are less likely to read "darker" emotions such as sadness or anger into pictures, that they recognize

"lighter" emotional expressions such as happiness earlier than "darker" ones, and draw more "happy faces" than faces expressing other emotions. The findings from the current study are consistent with this previous research.

It is important to note that although over half of the children with autism did not report the use of a specific strategy that helped them recognize emotions in the artwork, this does not mean that they were not using effective strategies. Given the communication deficits that characterize autism, it is possible that children were unable to verbalize the strategies they were using or simply did not understand the question. It is also possible that children with autism were not using strategies employed by the typically developing participants, such as reliance on facial expressions. Callaghan (1997) found that typically developing children tended to rely on subject matter rather than formal properties such as line quality and colour when making judgements about the emotionality of artwork, and that this pattern was reversed for adults. Findings from the current pilot study are consistent with these previous results. Children may have relied on the mouth to make decisions about the emotional tone of the drawing because children's human figure drawings often have limited facial features, including eyes, nose, and mouth. Many children have a tendency to repeat the eyes and nose which are often portrayed as dots, and vary the U-shaped mouth in order to indicate emotion.

General Discussion

This pilot study was a preliminary step that helped to lay the groundwork for future research into the visual expression and recognition of emotion in children on the autism spectrum. In general, I was surprised and impressed that all 40 of the participants successfully completed this study. It seemed that creating and looking at artwork

captured children's interest and motivated them to stay engaged in the activity. I was also surprised by the variety of responses in both the expression and recognition phases of this study. Each of the participants was so unique that it called into question what is "typical"? Perhaps making comparisons between groups based on diagnosis is not helpful as it does not capture the individual experience of each child. It is possible that this is why there were no significant differences between groups, because any individual variations were eliminated by grouping children in this way. In order to better understand the visual expression and recognition of emotions in the artwork of children with autism, perhaps future research could focus on a deeper analysis of the unique responses that are offered by individuals on the autism spectrum, as opposed to a shallow comparison between groups.

In the current study, all children in the expression phase successfully completed the drawings of four basic emotions. However, in the recognition phase, children generally found it difficult to accurately guess the intended emotion in another child's drawing. It seemed that children's artistic expression of emotions was often ambiguous, especially in reference to sadness, anger, and fear. This underlines the subjectivity of artistic expression and may serve as a cautionary note to art therapists. When trying to understand children's artistic expressions, it is of central importance to ask children what they are trying to express through their artwork, as we cannot assume that their feelings can be clearly read in their images.

I would like to emphasize that labelling emotions using categories such as "happy," "sad," "angry," and "scared" may provide a common language that can help people try to understand one another. However, I wonder if this type of categorization is

truly informative of personal experience or if it is simply the product of conformity due to socialization, or something we are taught to do, like naming colors. Burkitt (2004) suggests that children's drawings could just be a matter of adherence to pictorial conventions and cultural rules. I wondered if the children with autism in this study were explicitly taught how to depict emotions pictorially, as some children tended to rely on iconic facial expressions.

It is possible that children with autism performed as well as typically developing peers in this emotion recognition task because they were only asked to recognize so-called "basic" emotions. Williams and Happé (2010) outlined how the type of emotion is of important consideration because "social" or "self-conscious" emotions, such as embarrassment, pride, guilt, or jealousy may not be equivalent to "basic" emotions, such as happiness, sadness, anger, and fear. Williams and Happé (2010) outlined how, unlike basic emotions which are thought to be innate, social emotions are often considered to be socially constructed and are therefore related to general socio-emotional understanding. It is possible that if more complex social emotions were included in this study, children with autism may have had more difficulty than their typically developing peers at expressing and recognizing these feelings in artwork. Finally, La Voy and colleagues (2001) outlined research which suggests that children's drawings are reflective of their culture. This may be of interest when considering the different ways that members of the "autism culture" might understand and express feelings. Perhaps given their neurodevelopmental differences, individuals with autism simply have a different way of relating in the world, which should be acknowledged and respected.

The expression and recognition of emotion are seen by some as core deficits in individuals with autism. Most studies that have been conducted in this area have been limited by results that preclude any firm conclusions and call for further research. Gaining a more thorough understanding of the expression and recognition of emotions in the artwork of children with high-functioning autism will help to give art therapists a better understanding of the strengths and weaknesses of children with this challenging developmental disorder. These capacities may then be addressed through art therapy interventions tailored to target the specific emotional strengths and limitations of children with autism. Additionally, gaining a deeper understanding of how children with autism express and recognize emotion in artwork may help art therapists come to a better understanding of their inner affective worlds so that they can appreciate the unique way in which some children communicate and understand emotions. This pilot study underlines the importance of establishing robust methods that will contribute to the art therapy literature and the development of this growing profession as a whole.

Implications for Art Therapy

Findings from the current pilot study have important implications for art therapy with children on the autism spectrum. This research may point to potential strengths in visual expression of emotions that could be developed through the visual arts in order to give children with autism a way to express inner feelings that might otherwise be difficult to put into words. Begeer and colleagues (2006) outlined how understanding emotional expressions helps people explain and anticipate the behaviour of others. One can imagine how scary the world might be if one could not understand the complexities of emotional life which often influence the behaviour of others. Perhaps art therapy interventions that

target the expression and recognition of emotion could help children with autism better understand emotion in themselves and in others so that they can more successfully relate to the world around them. Additionally, this nonverbal medium may also promote development of more direct communication and restructuring of emotional and cognitive processes in children with autism (Bentivegna, Schwartz, & Deschner, 1983).

Historically, much of the research in the area of autism has focused on deficits. Therefore, it is not surprising that clinical interventions which stem from this research often attempt to respond to these impairments by focusing on areas of weakness. As outlined by Konstantareas (2006), intervention often focuses on social interaction difficulties and problems interpreting and expressing emotion. A variety of interventions have helped children on the autism spectrum improve their socio-emotional abilities, such as strategies that explicitly address theory of mind, central coherence, emotion expression and recognition, and social skills using social stories, self as model video, social group training, role-playing, and rehearsal (e.g. Bernad-Ripoll, 2007; Konstantareas, 2006; Ryan & Charragáin, 2010; Smith, 2007). However, traditional interventions rarely seem to focus on the strengths of children with autism. In order to help children on the autism spectrum live their best lives, future art therapy interventions could focus on expression and recognition of emotions through visual arts, which could be a possible strength of some children with autism.

Freudenheim (2005) outlined how although art is a tool commonly used in clinical practice with children, there are a lack of quantitative studies examining the use of drawing as an intervention in psychotherapy. Freudenheim highlighted how drawing provides a natural mode of expression for children which can also facilitate verbal

expression of feelings. Freudenheim empirically demonstrated that drawing can help to increase mood and verbalizations of affect, which has important implications for the therapeutic use of drawing in clinical practice. Additionally, Hamama and Ronen (2008) demonstrated how drawing can be used as a self-report measure to assess children's treatment outcomes. They outlined how children's drawings can provide a wealth of information on how children view the world around them in addition to information about children's ability for self-awareness and the link between thoughts, feelings, and behaviours. In addition to these valuable clinical applications of visual arts, Eisner (1982) summarized a variety of positive outcomes associated with art activity, including the possibility that children can learn that ideas and emotions not physically present can be symbolized by images and that these images have the power to express emotions that cannot easily be expressed through other modes of communication. Together, these findings suggest that art therapy may be an effective treatment modality that could help children with autism meaningfully participate in the socio-emotional world.

Findings from the current pilot study suggest that artistic expression and recognition of emotion may not be as impaired in children with autism as was originally thought. This is also reflected by the reported effectiveness of art therapy for children on the autism spectrum. Several case studies show the efficacy of art therapy for individuals with autism spectrum disorders (e.g. Bentivegna, Schwartz, & Deschner, 1983; Buck, Goldstein, & Kardeman, 1984; Emery, 2004; Fox, 1998; Rozelle, 1982; Stack, 1998). However, there is a lack of large-scale empirical studies demonstrating the effectiveness of art therapy with this population. Although the current pilot study provides some interesting preliminary data on the expression and recognition of emotions in the artwork

of children with autism, it does not yet answer important questions, such as: How can art therapy help to improve the expression and recognition of emotion in children with autism? Further exploration in this field may suggest interventions that complement the strengths and address the weaknesses of children with autism. I have come to believe in the healing power of the creative process and it is my career goal to empirically demonstrate the efficacy of art therapy for children with autism in several areas, including expression and recognition of emotion, social skills, sensory integration, expansion of repertoire beyond restricted interests, and increased quality of life. In order to advance the field of art therapy we need to conduct reliable research on the efficacy of our treatment modality in order to give children access to the rich interventions provided by the creative arts therapies.

Limitations

There are several limitations to this research project, which for all intents and purposes may be seen as a pilot study; therefore, caution must be used when interpreting this preliminary data. Although all of the data was reviewed thoroughly, I would like to underscore that there is always the possibility for human error. Moreover, it is important to consider that there were only 8 children who created the drawings in the expressive phase of this study, and this small sample size makes it difficult to generalize the findings. Additionally, it is important to emphasize that drawing is a highly individual experience and each of the children approached the task of drawing the four emotional pictures in their own unique way. If, for example, 8 different children had participated in the first phase of the study the 32 drawings that were produced could have been very different, which could have significantly altered the results of this study. Therefore, the

findings from this pilot research should simply be viewed as stimulus for further research as they require replication and extension before any firm conclusions can be drawn.

Additionally, it is important to note that the two groups of children with and without autism that were compared in this study may not be equivalent, as they were not matched. Although the 20 typically developing participants included 10 girls and 10 boys, the participants with autism were not balanced for gender, and included only 6 girls and 14 boys. Although the literature does not focus on gender differences in the ability to visually express and recognize emotion in drawings, it is possible that this gender difference could have influenced the findings of this pilot study. Additionally, the 20 children with autism were generally older but had an overall lower verbal-mental age than the 20 typically developing children. Although children's comprehension of the four emotional labels written on the cue cards was tested, their reading ability was not assessed. It is important to note that children's reading ability could have made the participation process different for some children. There may be other factors that distinguish these two groups, such as the possibility that children with autism may have received training in emotional awareness, including understanding emotions through pictorial icons. Through such training, children with autism may also have been made more aware of "darker" feelings such as anger and fear, which some typically developing children may not have been explicitly taught. It is also possible that typically developing children may be encouraged to express happiness more often. For example, one typically developing girl in this study drew a similar iconic happy-faced stick figure for all four drawings, but her happy drawing included context - a sun and grass and she explained she was feeling happy because it was a nice day and she went on an outing with her family.

When only viewing these four drawings together and being presented with a forced choice for the four emotions the scores might have been higher, but out of context most children guessed that all four of her drawings were happy.

Perhaps not surprisingly, happiness seemed to be the easiest emotion for most children to express and also identify in the artwork of other children. However, the measurement of this variable may be confounded because happiness was the only so-called "lighter" emotion in the study, separating it from sadness, anger, and fear, the other so-called "darker" emotions. It is perhaps because of this distinction that the drawings of happiness seemed to stand out and were more easily and accurately classified. It is also possible that children have been socialized to please authority figures and may have frequently categorized the drawings as happy in order to present themselves in a positive light. All 32 of the children in this study had some variation in their responses and no one child responded with the categorization of happiness all of the time. Children selected happiness as a response approximately half the time, which may account for their lower accuracy when recognizing sadness, anger, and fear. Perhaps future research could adjust for this possible confound by providing more balanced stimuli that equally represent so-called "lighter" and "darker" emotions, such as: happiness, sadness, calm, and fear.

I would also like to briefly note that this type of research on emotion is restricted by the categorization of emotions into the narrow categories of happiness, sadness, anger, and fear. Forcing a choice of only one emotion using a multiple-choice design such as the one used in the current study limits participants' ability to give more creative and potentially personally meaningful responses. This type of categorization may also exclude other forms of emotional knowing (Fineman, 2004). Marginalization, in this

way, may even partially account for why children with autism are often considered to not have emotions, because they do not express feelings the way most people do. Especially when working with a unique population such as this, it is critical to consider if our measurement techniques are valid. As outlined by Frisch, Franko, and Herzog (2006), the categorization of emotions into homogeneous groups for the purpose of research may invalidate the process of individualized expression, which is a core concept in art therapy.

The challenge that researchers face is finding a way to understand emotions in a more multifaceted way, which unfortunately seems to be difficult to measure. Simple experience of emotions is rare (Noordhof, 2008), as emotions are constantly changing, overlapping, or ambivalent (Fineman, 2004). It is unlikely that someone feels exclusively happy, sad, angry, or scared at any one time, as there are a multitude of subtle nuances to human emotions. Feeling states can be difficult to verbalize and even more difficult to measure and compare between individuals, because the personal experience of emotions seems to be so subjective. Nonetheless, this pilot study may be seen as a first attempt to begin to consider ways that the expression and recognition of emotion can be studied in the drawings of children with autism. This research seemed to produce more questions than it was able to answer, but it serves as an important first step toward understanding some of the abilities of children with autism to express and recognize visual representations of some emotions.

Additionally, I would like to note that there are a variety of ways to work with this rich data. The primary focus of this pilot research was a more traditional quantitative approach because it provided a starting point to work from. Mixed methods were also included in order to round out and enrich the analyses which are by no means

comprehensive. In regards to the main finding of no significant difference between the groups of children with and without autism to recognize emotions in the drawings, I would also like to clearly state that statistical significance is not the same as clinical significance. In this way, non-significant results can also be meaningful. As outlined by Williams and Happé (2010), a finding of no statistical difference such as this, where a difference between groups is expected, can be clinically significant. Williams and Happé discussed how many studies have not been published because they fail to demonstrate statistical significance; however, this may create biased research that does not give the full picture of the emotional abilities of children on the autism spectrum.

Finally, we must be careful when applying this scientific data to clinical settings. Some children were able to successfully portray emotions that were easily recognized by their peers; however, this does not mean that they necessarily have an easier time expressing their emotions through other avenues, such as facially or verbally. Nonetheless, this pilot study presents significant stimulus for further study. Results from this pilot study suggest that there is something worth studying here, and that perhaps the visual expression and recognition of emotions may be a strength found in some children with autism.

Future Directions

Despite the limitations of this pilot study, this research has some encouraging preliminary findings which prompt further research. It will be of interest to investigate if high-functioning children with autism are in fact just as adept as their typically developing peers at expressing emotions artistically and recognizing emotions in the artwork of other children. If this is the case, it may have important clinical implications

for the treatment of children on the autism spectrum. For example, strengths in the visual expression and recognition of emotion could be directed into clinical interventions, such as the therapeutic use of drawings as an alternative mode of nonverbal expression. It is my hope that further clinical research will help identify the strengths of children on the autism spectrum so that clinicians working within supportive therapeutic models can help children with autism develop their unique strengths and reach their full potential. I would like to stress that there are a multitude of variables to consider when designing clinical research of this kind. Upon reflection, I realize that simply increasing the number of participants will not likely add much value to the findings of this pilot study, as each child is unique and so when collapsing over groups of children the richness of the data can be lost. Therefore, new innovative research methods should be considered when designing thoughtful and creative studies that will contribute to the literature.

Through this research experience, I have learned that drawings can act as an invaluable research tool. Although artistic expression can be subjective and difficult to measure, it is true that "a picture says a thousand words." In research, Kearney and Hyle (2004) found that drawings can successfully express emotions and present a concise presentation of children's experiences. However, Kearney and Hyle also noted that drawings can be affected by the structure imposed by the researcher and that they require additional verbal interpretation by the artist to ensure accurate interpretations. Nevertheless, Kearnery and Hyle highlighted that drawings can also help to minimize researcher bias when left unstructured and facilitate data triangulation. Given the overwhelming positive response I received from the participants in this study, I would recommend the use of drawings in future research with children on the autism spectrum.

In the current pilot study, I was struck by the individual variability of responses in the drawings. Suzuki and colleagues (2007) observed that despite the marked variability in individual experiences of emotion, this has not been the focus of much research. Investigating the individual experience of emotions in children with autism may be an interesting topic of research as opposed to simply looking at the differences between groups. Perhaps adopting more qualitative research methods would help capture the rich emotional experience of individual children on the autism spectrum. Fineman (2004) outlines a variety of qualitative methods that could be used to understand emotion without measuring it, including intensive ethnographies, diaries, clinical interviews, and storytelling, which provide rich, multidimensional information filled with ambiguities and contradictions. These apparent inconsistencies can be difficult for traditional quantitative researchers to digest, yet these ambiguities characterize the intricacies of emotional life, which is inherently complex. Perhaps this is one of the reasons that the area of emotion has been over-studied in the autism population yet is still not clearly understood. Additionally, having a less restrictive directive in which children could simply describe their emotional experiences through open-ended artwork might also be of great interest in understanding the emotional worlds of children on the autism spectrum.

In the current study, I explicitly asked children to draw a picture of themselves in emotional situations. It would be interesting to see how children with autism respond to a directive to express an emotion using “lines, shapes, and colors” like in the Diagnostic Drawing Series (Cohen, Mills, & Kijak, 1994). As Allen (2009) outlines, children with autism may have particular difficulty recognizing emotion in abstract drawings because they cannot rely on the physical appearance of the image, and so must have more of an

understanding of the artist's intention in order to interpret the emotion represented in the drawing. Additionally, although drawing seems to be a successful way for children with autism to express themselves, it would also be interesting to explore if less structured art media such as painting or sculpture also provides a valuable means of emotional expression. This could be investigated through a similar experimental process in which children are asked to express feelings using different art media. Findings from research such as this could help art therapists to structure successful interventions for children on the autism spectrum.

Dennis (2010) outlined how recent research in neuroscience suggests that the relationship between cognition and emotion may underlie emotion regulation, as thoughts and feelings are complementary and coordinated. Dennis also reviewed studies showing that scalp-recorded event related potentials (ERPs), displaying the integration of cognition and emotion, may be used as physical measures of emotion regulation in children. It may be interesting to conduct a study investigating the expression of emotions in artwork by children on the autism spectrum, using ERPs to simultaneously measure emotional regulation. It may also be of interest to incorporate more sensitive methods of measuring emotion, such as Carrera and Oceja's (2007) analogical emotional scale which measures the subjective experience of mixed emotions. This scale is sensitive to how emotions seem to subjectively evolve over time and allows for discrimination between both simultaneous and sequential mixed emotional experiences. Future research could consider the complexities of emotion using more sensitive forms of measurement such as these.

Finally, in the current pilot study, trends in the preliminary data suggest that children with autism may be better at expressing than recognizing emotions in artwork. This may relate to difficulties that children with autism seem to have with "emotional empathy." Modelled after the work of Prusakova and Sergienko (2006) who investigated emotional understanding in typically developing children, it may be of interest to investigate how children with autism depict their own emotions in relation to another person's emotions. Prusakova and Sergienko found that children who did not have theory of mind abilities tended to depict their own emotions using a human figure but used symbols to illustrate another person's emotion. This has important implications for children with autism who traditionally have difficulty with theory of mind tasks. If the comprehension of emotions in others is related to the development of theory of mind, it would be of interest to examine how children with autism respond to this task.

Through this research process, I have begun to learn how to balance practical and meaningful ways of conducting research. I now more fully understand the value of mixed methods which incorporate both quantitative and qualitative ways of knowing. In future research, I will strive to draw on mixed methods in order to more fully understand the visual expression and recognition of emotions in children on the autism spectrum.

Conclusion

The expression and recognition of emotions in children with autism is difficult to study but worthy of research because of its clinical importance in everyday social functioning. Therefore, future research should strive to elucidate how children with autism express and recognize emotions. Findings from this preliminary study suggest that artistic expression and recognition of emotion may be a potential strength in some children with autism. Through art, perhaps children with autism can find a way to literally draw out their inner feelings and more fully participate in the rich socio-emotional world.

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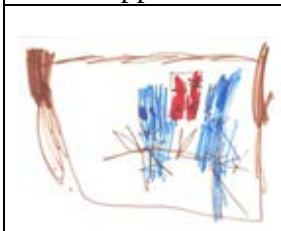
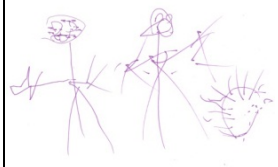
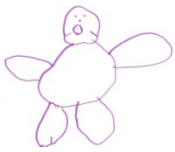
Figures

Figure 1. Table of 32 drawings made by the 8 children in the expression phase of the study.

Participant #1: 6-year-old boy with autism			
Happiness	Sadness	Anger	Fear
			
Participant #2: 7-year-old boy with autism			
Happiness	Sadness	Anger	Fear
			
Participant #3: 6-year-old girl with autism			
Happiness	Sadness	Anger	Fear
			
Participant #4: 7-year-old boy with autism			
Happiness	Sadness	Anger	Fear
			

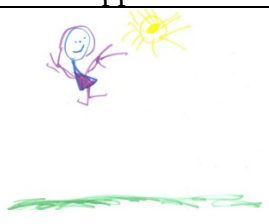
Participant #5: 6-year-old boy without autism			
Happiness	Sadness	Anger	Fear
			
Participant #6: 6-year-old boy without autism			
Happiness	Sadness	Anger	Fear
			
Participant #7: 5-year-old girl without autism			
Happiness	Sadness	Anger	Fear
			
Participant #8: 5-year-old girl without autism			
Happiness	Sadness	Anger	Fear
			

Figure 2. “Happy” drawing by a girl with autism.

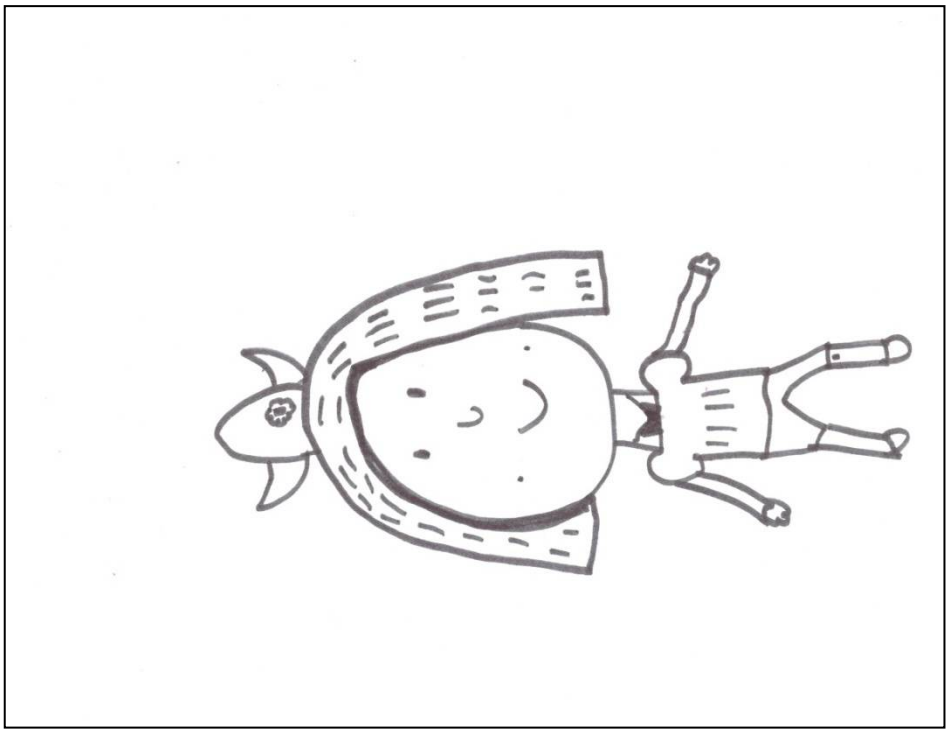


Figure 3. “Happy” drawing by a typically developing girl.

Figure 4. “Sad” drawing by a boy with autism.

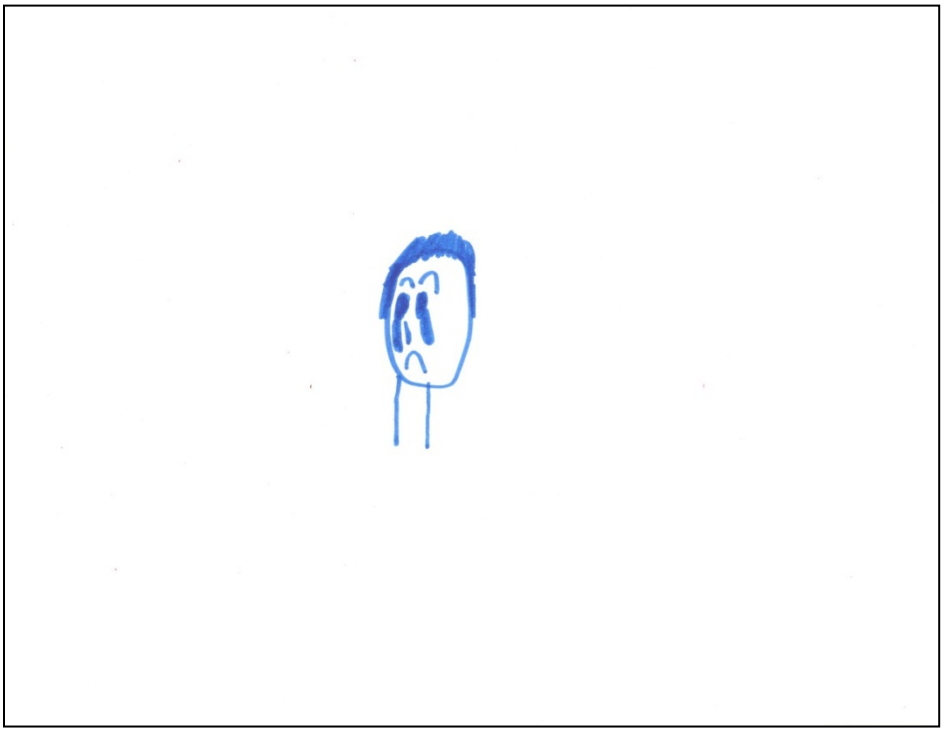


Figure 5. “Angry” drawing by a boy with autism.

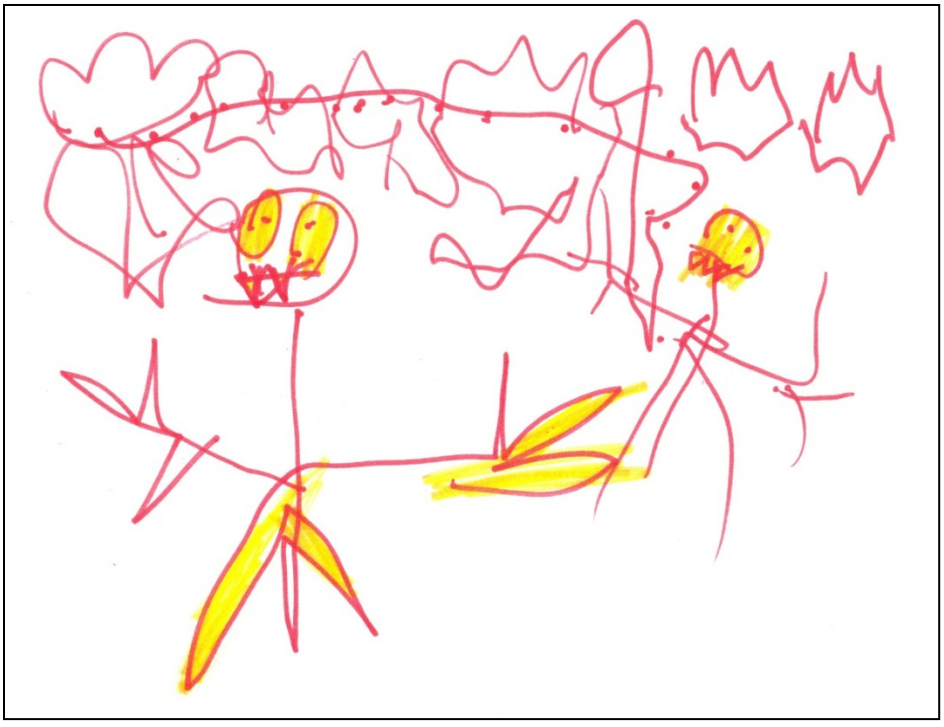


Figure 6. “Scared” drawing by a boy with autism.

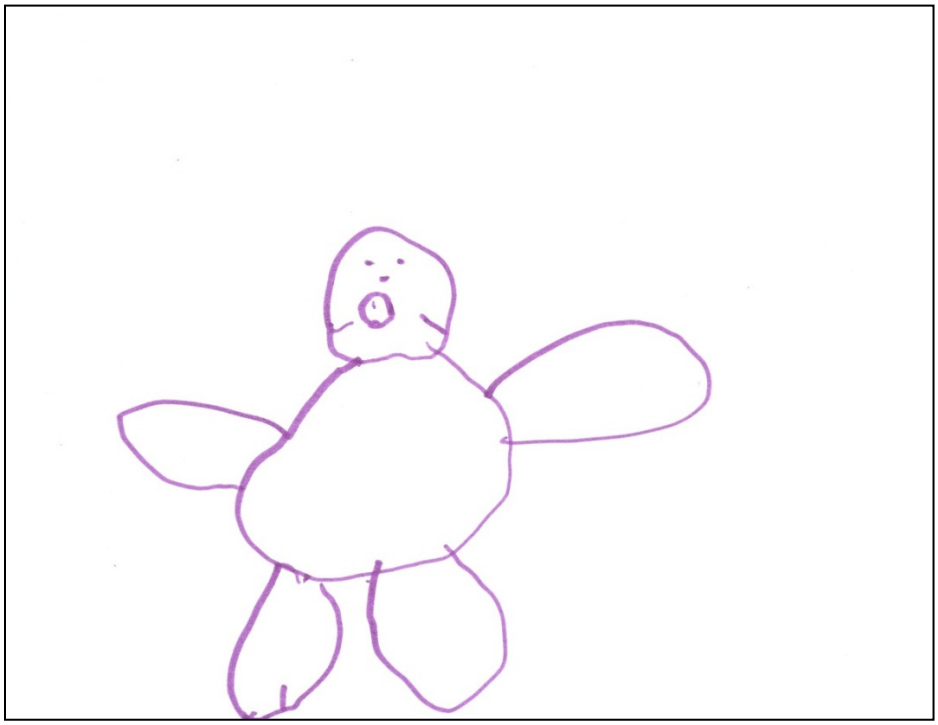


Figure 7. “Scared” drawing by a boy with autism.

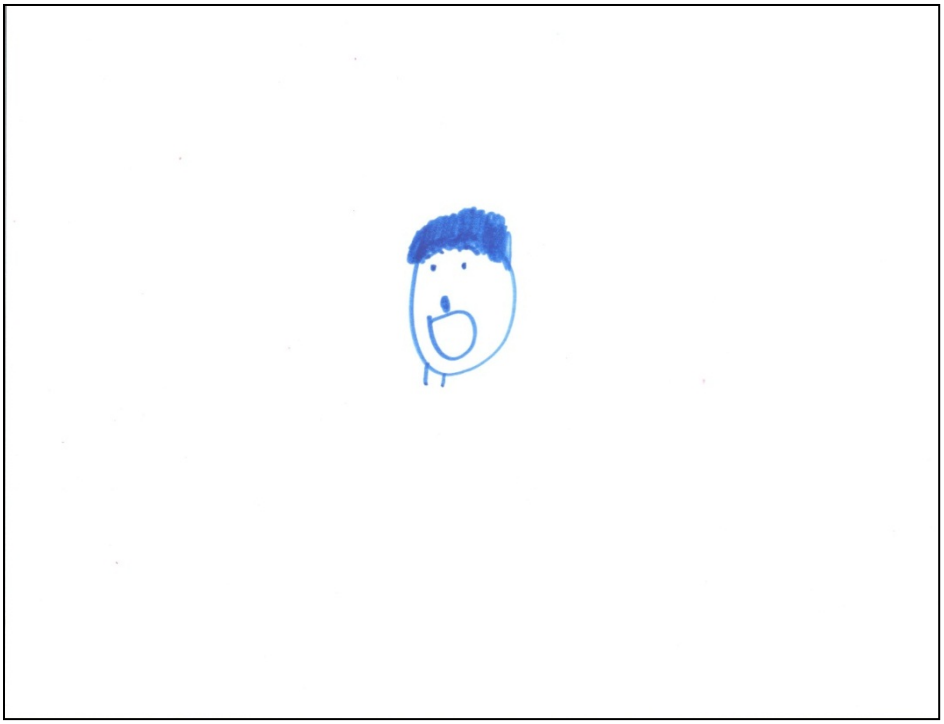


Figure 8. “Angry” drawing by a typically developing girl.

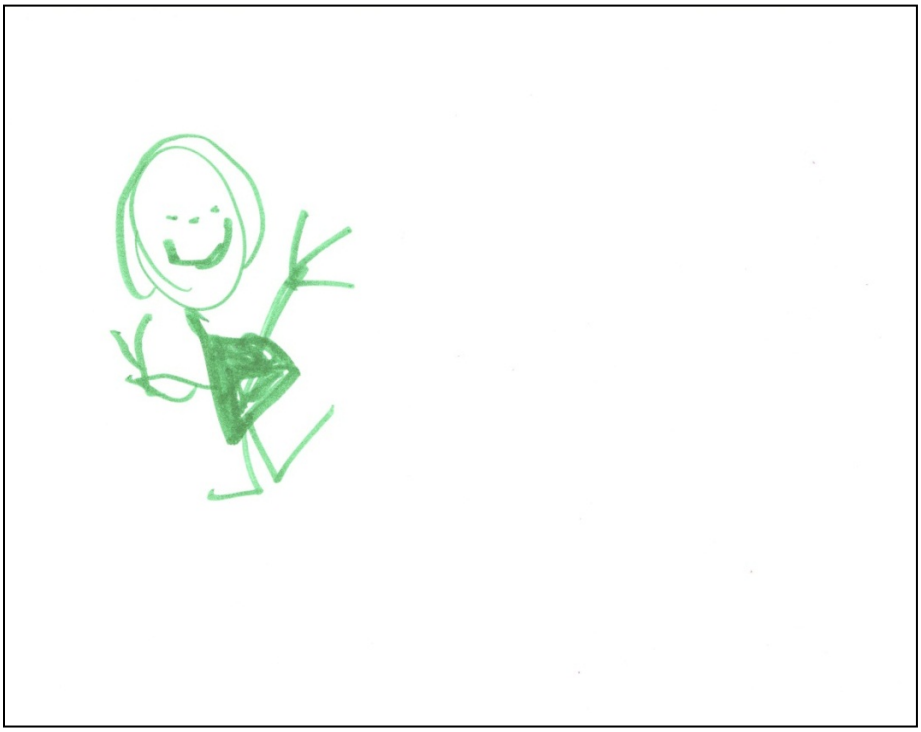


Figure 9. “Sad” drawing by a typically developing girl.

Figure 10. Histogram showing no significant difference between the emotion recognition abilities of children with and without autism.

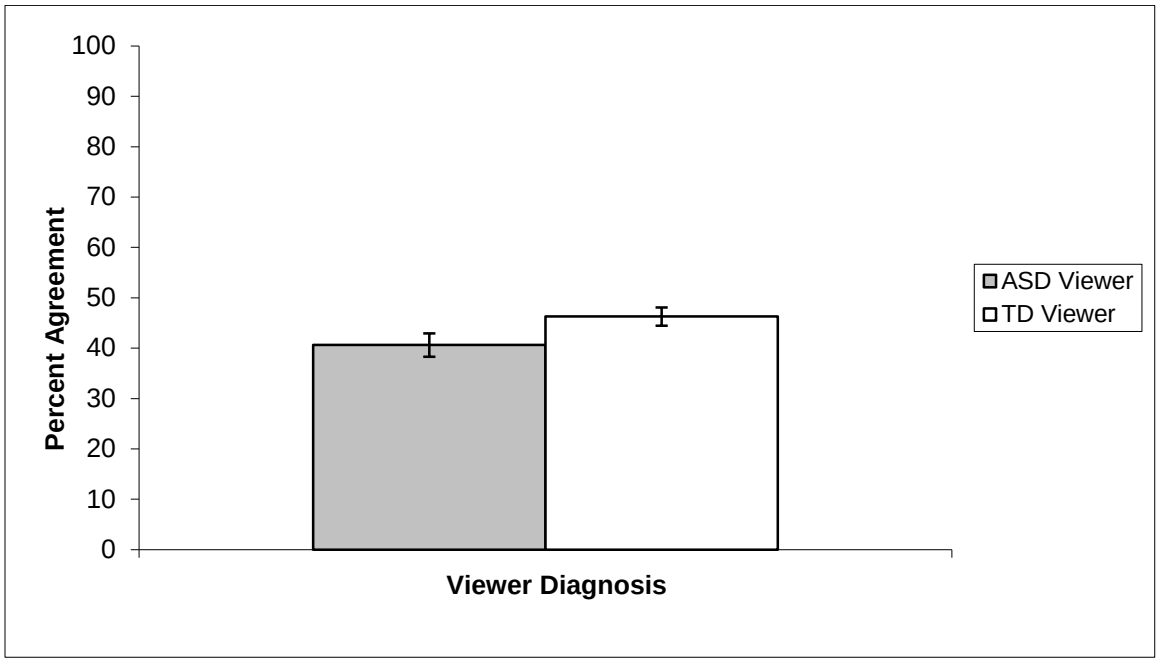


Figure 11. Histogram showing that drawings made by children with autism received significantly higher ratings of agreement than drawings made by typically developing children, but no significant difference between the ability of children with autism to recognize the expression of emotion in the artwork of other children with autism, as compared to their typically developing peers.

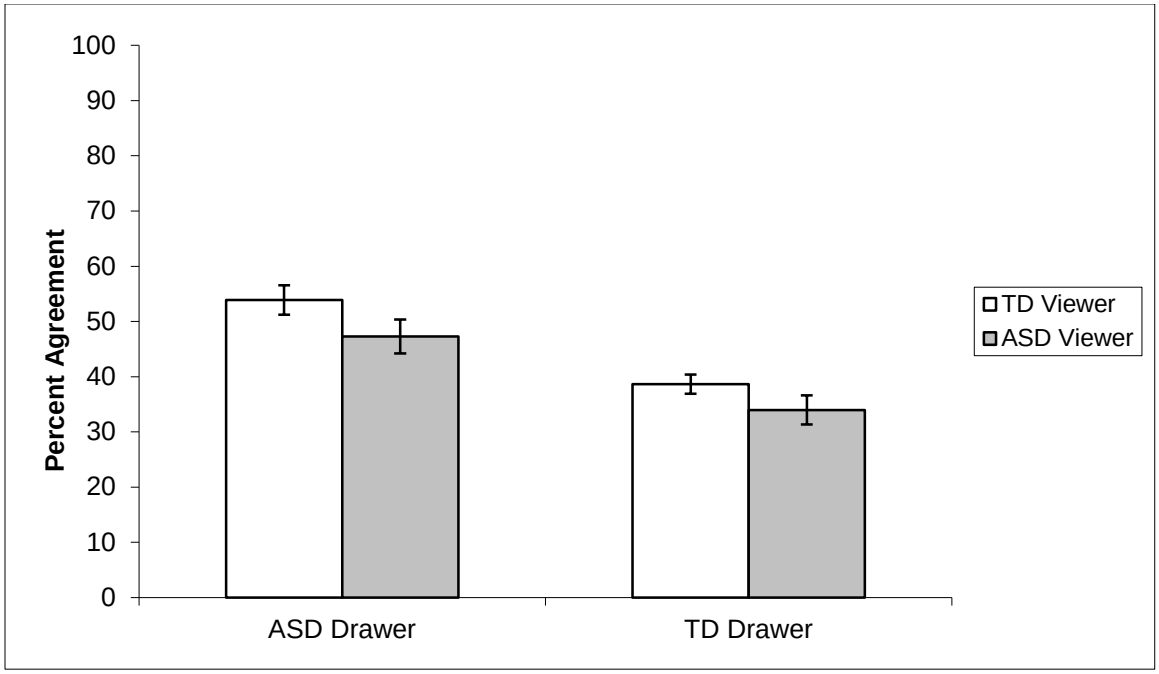
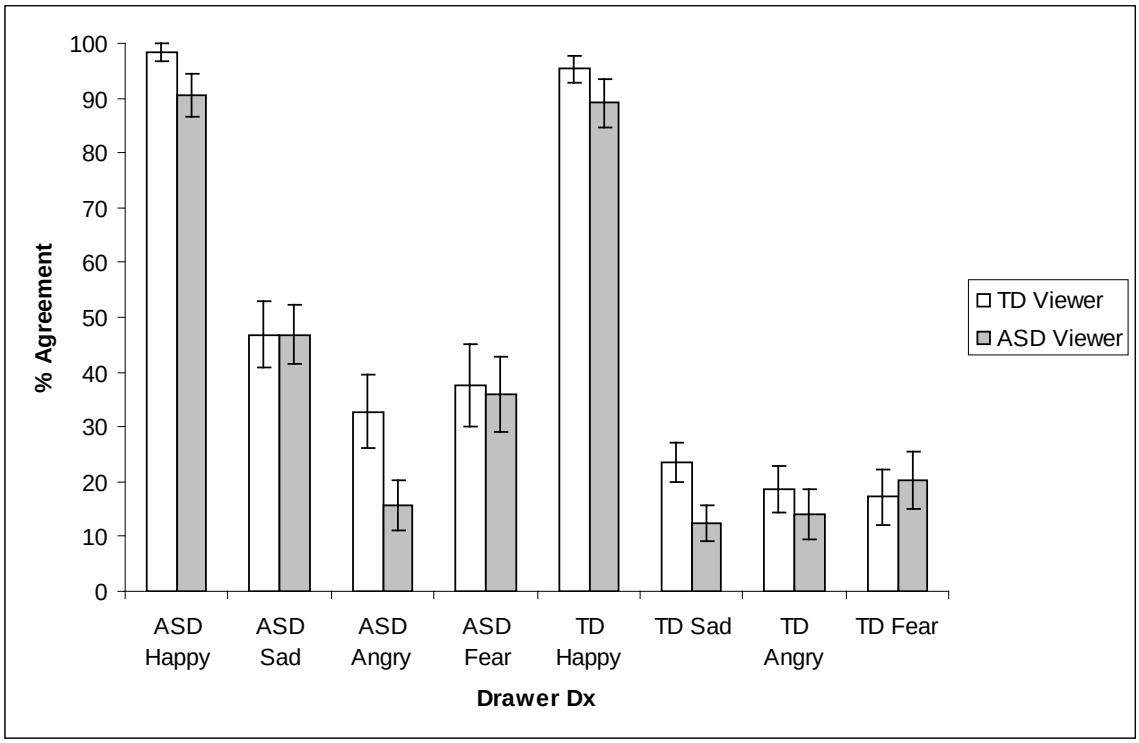


Figure 12. Histogram showing that happiness received significantly higher ratings of agreement than the three "darker" emotions, but no significant difference between the recognition of the four individual emotions between the two groups of children with and without autism.



Appendix 1. Phase I ASD Recruitment Letter

May 27th, 2010

Dear Parent/Guardian,

We are conducting a study of how children with Autism Spectrum Disorder (ASD) depict and recognize emotions in artwork. We are contacting parents who have a child with ASD to discuss the possibility of your child participating in our study.

The study is being conducted by Dr. Susan Bryson at the IWK Health Centre. The main purpose of this study is to explore the difficulties that some children with ASD have expressing emotions. We would like to find out more about how children with ASD express different feelings in artwork.

The study involves a single visit in the IWK Health Centre lasting approximately one hour. Your child will be asked to create four drawings about different feelings. He/she will also be asked to participate in a brief language assessment. We are seeking 5-9 year-old children with ASD with good language skills to participate in the study. Children will receive a small gift and a certificate in thanks for their participation.

If you are interested in learning more about the study, please contact Julie Longard by phone at (902) 470-7275, or by email at julie.longard@iwk.nshealth.ca.

Thank you for your consideration.

Yours sincerely,

Susan E. Bryson, PhD
Professor and Craig Chair in Autism Research
Autism Research Unit
IWK Health Centre

Appendix 2. Phase I TD Recruitment Letter

May 27th, 2010

Dear Parent/Guardian,

We are conducting a study of how children with Autism Spectrum Disorder (ASD) depict and recognize emotions in artwork. For the purpose of this study, we are seeking a comparison group of typically developing children aged 5-7 years. We are contacting parents who have a typically developing child to discuss the possibility of your child participating in our study.

The study is being conducted by Dr. Susan Bryson at the IWK Health Centre. The main purpose of this study is to explore the difficulties that some children with ASD have expressing emotions. We would like to find out more about how children with ASD express different feelings in artwork.

The study involves a single visit at the IWK Health Centre lasting approximately one hour. Your child will be asked to create four drawings about different feelings. He/she will also be asked to participate in a brief language assessment. We are seeking 5-7 year-old typically developing children to participate in the study. Children will receive a small gift and a certificate in thanks for their participation.

If you are interested in learning more about the study, please contact Julie Longard by phone at (902) 470-7275, or by email at julie.longard@iwk.nshealth.ca.

Thank you for your consideration.

Sincerely,

Susan E. Bryson, PhD
Professor and Craig Chair in Autism Research
Autism Research Unit
IWK Health Centre

Appendix 3. Phase II ASD Recruitment Letter

May 27th, 2010

Dear Parent/Guardian,

We are conducting a study of how children with Autism Spectrum Disorder (ASD) depict and recognize emotions in artwork. We are contacting parents who have a child with ASD to discuss the possibility of your child participating in our study.

The study is being conducted by Dr. Susan Bryson at the IWK Health Centre. The main purpose of this study is to explore the difficulties that some children with ASD have understanding emotions. We would like to find out more about how children with ASD recognize different feelings in artwork.

The study involves a single visit, in either your child's daycare or the IWK Health Centre, lasting approximately one hour. Your child will be asked to view and discuss several children's drawings about different feelings. He/she will also be asked to participate in a brief language assessment. We are seeking 5-9 year-old children with ASD with good language skills to participate in the study. Children will receive a small gift and a certificate in thanks for their participation.

If you are interested in learning more about the study, please contact Julie Longard by phone at (902) 470-7275, by email at julie.longard@iwk.nshealth.ca.

Thank you for your consideration.

Yours sincerely,

Susan E. Bryson, PhD
Professor and Craig Chair in Autism Research
Autism Research Unit
IWK Health Centre

Appendix 4. Phase II TD Recruitment Letter

May 27th, 2010

Dear Parent/Guardian,

We are conducting a study of how children with Autism Spectrum Disorder (ASD) depict and recognize emotions in artwork. For the purpose of this study, we are seeking a comparison group of typically developing children aged 5-7 years. We are contacting parents who have a typically developing child to discuss the possibility of your child participating in our study.

The study is being conducted by Dr. Susan Bryson at the IWK Health Centre. The main purpose of this study is to explore the difficulties that some children with ASD have understanding emotions. We would like to find out more about how children with ASD recognize different feelings in artwork.

The study involves a single visit in your child's daycare lasting approximately one hour. Your child will be asked to view and discuss several children's drawings about different feelings. He/she will also be asked to participate in a brief language assessment. We are seeking 5-7 year-old typically developing children to participate in the study. Children will receive a small gift and a certificate in thanks for their participation.

If you would like your child to participate in this study you are invited to sign the attached Information and Authorization form and return it to your child's daycare. If you are interested in learning more about the study, please contact Julie Longard by phone at (902) 470-7275, or by email at julie.longard@iwk.nshealth.ca.

Thank you for your consideration.

Yours sincerely,

Susan E. Bryson, PhD
Professor and Craig Chair in Autism Research
Autism Research Unit
IWK Health Centre

Fun Research Opportunity!

A study is being conducted by Dr. Susan Bryson at the IWK Health Centre. The main purpose of this study is to explore the difficulties that some children with Autism Spectrum Disorder (ASD) have understanding and expressing emotions. We would like to find out more about how children with ASD depict and recognize different feelings in artwork.

The study involves a single visit in your child's daycare lasting less than one hour. Your child will be asked to view and discuss several children's drawings about different feelings. He/she will also be asked to participate in a brief language assessment. We are seeking **5-9 year-old children with ASD with good language skills** and **5-7 year-old typically developing children** to participate in the study. Children will receive a small gift and a certificate in thanks for their participation.

If you are interested in finding out more about this study, please contact:
Julie Longard at (902) 470-7275 or julie.longard@iwk.nshealth.ca

Information and Authorization Form

Study title: Drawing out inner feelings: The visual expression and recognition of emotions in the art of children with autism

Investigators: **Supervisor**: Susan Bryson, PhD, Department of Pediatrics, IWK Health Centre/Dalhousie University, Halifax, Nova Scotia

Graduate Student: Julie Longard, BSc Hons, Department of Creative Arts Therapies, Concordia University, Montréal, Québec

Funding source: Autism Research Centre, IWK Health Centre

Introduction

Your child is being invited to take part in the research study named above. It is important that you understand the purpose of the study, how it may affect your child, the risks and benefits of taking part, and what you will be asked to do, before you decide if you want your child to take part. This information and authorization form is to help you decide if it is in your child's best interest to take part in this study. Your child does not have to take part in this study. Taking part is entirely voluntary (your choice). If you have any questions that this form does not answer, the study investigator (Julie Longard) will be happy to give you further information.

Purpose

Children with Autism Spectrum Disorder (ASD) often have difficulty understanding and expressing feelings. This study will explore how children with and without ASD express and recognize emotions in drawings. This may give us important information about the emotional abilities of children with ASD which could help us develop better interventions for these children.

Study design

The study involves a single visit lasting approximately 1 hour in your child's daycare or the IWK Health Centre, whichever you prefer. This study has two stages and your child will be asked to participate in only one stage. In the first stage, a few children with and without ASD will create drawings of four emotions. In the second stage, other children with and without ASD will view the drawings created in the first stage and say which emotion they think the drawing represents. We anticipate enrolling a total of 20 children with ASD and 20 typically developing children with verbal-mental ages between 5 and 7 years.

Potential harms
There are no expected harms. However, unforeseen risks are possible. Some children may feel uncomfortable expressing different feelings using drawings or they may feel uncertain about expressing anger, fear, or sadness. Some children may also find it uncomfortable to look at the expression of anger, fear, or sadness in the drawings of other children. However, if a child shows any signs of discomfort or fatigue the study will be stopped immediately.

Potential benefits
Many children with ASD find the visual arts to be an easy way to communicate. Most children will likely enjoy this experience and may like using the art materials to express themselves or enjoy viewing the artwork of other children. Children may also learn a bit about themselves and their different feelings through making and looking at artwork. Although there may not be benefit to your child personally, it is hoped that what is learned will be of future benefit to children with ASD.

Can I withdraw from the study?
If you choose to participate, you can withdraw your child from the study at any time. You and your family will continue to have access to quality care at the IWK.

Costs and reimbursements
We will reimburse your parking costs at the time of your visit to the IWK Health Centre.

How will my privacy be protected?
Confidentiality will be respected. No information that discloses the identity of participants will be released or published without consent unless required by law. The results of the assessments will be used for research purposes alone and only for this study. We will send you a brief study summary after the research is completed. We would need your permission and signed consent to share our assessment results with other professionals involved with your child. Study records will be stored in a locked area, and will be kept for 5 years. This information will be accessible only to the study investigator and her assistants.

What if I have study questions or problems?
Please feel free to contact Julie Longard by phone at 470-7275 or by e-mail at julie.longard@iwk.nshealth.ca, to discuss any aspects of the study.

What are my research rights?
Your signature on the form will show that you have understood to your satisfaction the information about the research study. Agreeing to participate in this study does not mean that you waive your legal rights nor does it release the investigator or other involved parties from their legal and professional responsibilities.

If you have any questions at any time during or after the study about these legal rights or about research in general and you would like an independent opinion, you may contact the Research Office of the IWK Health Centre at 470-8765, Monday to Friday between 9am and 5pm.

How will I be informed of the study results?
No individual results will be provided. However, a summary of the group results of this study will be available in approximately 1 year. If you would like to receive a group summary of the study results, please provide your name and address below.

A summary of the study results will be sent to:

Name (Print): _____

Please check preferred means of communication and provide relevant address:

☐ Email: _____

OR

☐ Mail: _____

_____

_____

_____

Authorizing signature: _____

Drawing out inner feelings:
The visual expression and recognition of emotions in the art of children with autism

Participant ID: _____ Participant Initials: _____

Parental or Guardian Authorization – if participant living in the care of parent or guardian. I have read or had read to me this information and authorization from and have had the chance to ask questions which have been answered to my satisfaction before signing my name. I understand the nature of the study. I understand that I have the right to withdraw my child from the study at any time without affecting my child's care in any way. I have received a copy of the Information and Authorization Form for future reference. I freely agree to have my child participate in this research study.

_____	_____
Name of Participant (Print)	Signature of Participant (if applicable)
_____	X_____
Name of Parent/Guardian (Print)	Signature of Parent/Guardian
Date: _____ Time: _____	

STATEMENT BY PERSON PROVIDING INFORMATION ON STUDY
I have explained the nature and demands of the research study and judge that the Parent/Guardian/Participant named above understands the nature and demands of the study.

Name (Print): _____ Position: _____

Signature: _____ Date: _____ Time: _____

STATEMENT BY PERSON OBTAINING CONSENT
I have explained the nature of the consent process to the person authorized and judge that they understand that participation is voluntary and that they/their child may withdraw at any time from participating.

Name (Print): _____ Position: _____

Signature: _____ Date: _____ Time: _____

Drawing out inner feelings:
The visual expression and recognition of emotions in the art of children with autism

Consent to Use of Artwork (For participants in Stage I ONLY)

Participant ID: _____ Participant Initials: _____

Name of Participant: _____

I agree to the use of artwork of the above named participant for **research purposes only.**

_____	_____
Name of Participant (Print)	Signature of Participant (if applicable)
_____	X _____
Name of Parent/Guardian (Print)	Signature of Parent/Guardian
Date: _____ Time: _____	

I agree to the use of artwork of the above named participant both for **research purposes and for teaching and presentation purposes.**

_____	_____
Name of Participant (Print)	Signature of Participant (if applicable)
_____	_____
Name of Parent/Guardian (Print)	Signature of Parent/Guardian
Date: _____ Time: _____	

_____	_____
Name of Witness (Print)	Signature of Witness
Date: _____ Time: _____	

Certificate of Recognition

This Certifies that _____

has participated in research at the Autism Research Centre,
IWK Health Centre/Dalhousie University.

Thank you for your valuable contribution.

Signed: _____

Date: _____

Appendix 8. Descriptive Statistics.

Rater Diagnosis	Drawer Diagnosis & Emotion	N	Minimum	Maximum	Mean		Std. Deviation
		Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
TD[1]	TD Rater Total Agreement	16	34	59	46.29	1.809	7.237
	Total ASD Drawer Agreement	16	38	75	53.91	2.668	10.674
	Total TD Drawer Agreement	16	25	50	38.67	1.732	6.929
	ASD Drawer Happiness Agreement	16	75	100	98.44	1.563	6.250
	ASD Drawer Sadness Agreement	16	25	100	46.88	5.984	23.936
	ASD Drawer Anger Agreement	16	0	75	32.81	6.739	26.955
	ASD Drawer Fear Agreement	16	0	75	37.50	7.569	30.277
	TD Drawer Happiness Agreement	16	75	100	95.31	2.519	10.078
	TD Drawer Sadness Agreement	16	0	50	23.44	3.586	14.343
	TD Drawer Anger Agreement	16	0	50	18.75	4.270	17.078
	TD Drawer Fear Agreement	16	0	50	17.19	4.958	19.830

[1] Typically developing participant

Rater Diagnosis	Drawer Diagnosis & Emotion	N	Minimum	Maximum	Mean		Std. Deviation
		Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
ASD[2]	ASD Rater Total Agreement	16	25	56	40.63	2.335	9.340
	Total ASD Drawer Agreement	16	25	75	47.27	3.071	12.283
	Total TD Drawer Agreement	16	13	50	33.98	2.613	10.450
	ASD Drawer Happiness Agreement	16	50	100	90.63	3.870	15.478
	ASD Drawer Sadness Agreement	16	0	75	46.88	5.532	22.127
	ASD Drawer Anger Agreement	16	0	50	15.63	4.492	17.970
	ASD Drawer Fear Agreement	16	0	75	35.94	6.835	27.339
	TD Drawer Happiness Agreement	16	50	100	89.06	4.546	18.186
	TD Drawer Sadness Agreement	16	0	25	12.50	3.227	12.910
	TD Drawer Anger Agreement	16	0	50	14.06	4.546	18.186
	TD Drawer Fear Agreement	16	0	75	20.31	5.214	20.854

[2] Participant with an autism spectrum disorder